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XC-142A VTOL TRANSPORT

MONTHLY PROGRESS REPORT

VOLUME NO.

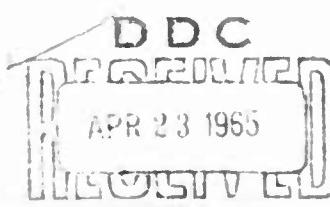
33

CONTRACT NO. AF33(657)-7868

LTV LING-TEMCO-VOUGHT, INC.

HILLER

RYAN



LTV VOUGHT AERONAUTICS DIVISION

P. O. BOX 5907
DALLAS, TEXAS 75222

2-12000/4L-30

22 October 1964

To: Headquarters, Aeronautical Systems Division
Air Force Systems Command, United States Air Force
Wright-Patterson Air Force Base, Ohio

Attn: ASZTV/Lt. Col. E. F. Callaghan

Via: Bureau of Naval Weapons Representative, Dallas, Texas (4 cys w/2 cys
encl (1))

Subj: Air Force Letter Contract AF33(657)-7868, Tri-Service Transport Air-
craft (XC-142A) Program; Monthly Progress Report, Submittal of

Encl: (1) XC-142A Monthly Progress Report No. 33 (18 cys)

1. In accordance with the requirement of subject contract, Monthly Progress Report No. 33, depicting progress made on the XC-142A program during the month of September, 1964, is submitted as enclosure (1).

Respectfully,

L. C. Josephs
Program Director, VTOL

ELJ/ch

Copy to:

Air Force Contracting Officer, San Diego Contract Management District, 3054
Rosecrans Place, San Diego, California, Attn: Mr. Olin D. Stutzman
(1 cy encl (1))

Air Force Flight Test Center, Edwards Air Force Base, California (1 cy
encl (1))

Army Aviation Test Board, Ft. Rucker, Alabama, Attn: President (1 cy encl (1))

Army Materiel Command, Washington, D.C., Attn: AMCRD-DE-MO (3 cys w/3 cys
encl (1))

Army Test Activity, VTOL Support Division, Edwards Air Force Base, California
(1 cy encl (1))

Hq. ASD, AFSC, Wright-Patterson Air Force Base, Ohio, Attn: ASZTK/Mr. P. G.
Kempas (1 cy encl (1))

BuNaval Weps Rep, c/o General Dynamics Corp., Convair Division, San Diego 12,
California (1 cy encl (1))

BuNaval Weps Rep, c/o Hiller Aircraft Company, 1350 Willow Road, Palo Alto,
California (1 cy encl (1))



LTV Vought Aeronautics Letter to Aeronsutical Systems Division, Subj: "Air Force Letter Contract AF33(657)-7868, Tri-Service VTOL Transport Aircraft (XC-142A) Progress

BuNaval Weps Fleet Readiness Rep., Central, Wright-Patterson Air Force Base, Ohio (1 cy encl (1))
BuWeps, Washington, D.C., Attn: Cdr. F. L. Highsmith, RA-443 (3 cys encl (1))
Commanding Officer, U.S. Army Transportation Research Command, Ft. Eustis, Va.,
Attn: TCRD-ADD (4 cys w/4 cys encl (1))
Comptroller, U.S. Army Transportation Research Command, Ft. Eustis, Va.,
Attn: Mr. George Ean (1 cy encl (1))
NASA, Ames Research Center, Moffett Field, California, Attn: Mr. W. Harper
(1 cy encl (1))
NASA, Hq., 1512 H Street, N.W., Washington 25, D.C., Attn: Mr. Jack D. Brewer
Code RAA (1 cy encl (1))
NASA, Langley Research Center, Langley Field, Va., Attn: Mr. John P. Campbell
(1 cy encl (1))
Office of Chief of R&D, Department of the Army, Washington, D.C., Attn: Air Mobility Division (2 cys w/2 cys encl (1))

(6) XC-142A

VTOL TRANSPORT PROGRAM

(15) CONTRACT ■ AF33(657)-7868 ✓

(9) MONTHLY PROGRESS REPORT

(10) SEP 1964,

(5) LTV VOUGHT AERONAUTICS DIVISION

Ling-Temco-Vought, Inc., Dallas, Tex.

H. C. Josephs
L. C. Josephs
Program Director

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TABLE OF CONTENTS

	<u>Page No.</u>
INTRODUCTION.	1
SUMMARY	2
PROGRAM MASTER SCHEDULE	3
ITEM 1.A DEVELOPMENT OF XC-142A AND FABRICATION OF FIVE PROTOTYPE MODELS.	5
ITEM 1.B FABRICATION OF STATIC TEST ARTICLE.	6
ITEM 2 FABRICATION OF MOCKUP	6
ITEM 3 GROUND TEST PROGRAM	6
ITEM 4 ENGINEERING DATA.	15
ITEM 5 DESIGN DATA	16
ITEM 6 FLIGHT TEST AND DEMONSTRATION	16
ITEM 7 REPORTS	21
ITEM 8 SPARE PARTS FOR FIVE PROTOTYPE AIRPLANES.	21
ITEM 9 DEVELOPMENT AND FABRICATION OF AGE.	21
ITEM 10 SPARE PARTS FOR AGE	22
ITEM 11 TRAINING AND TRAINING EQUIPMENT	22
ITEM 12 CONTRACTOR SUPPORT OF FLIGHT TEST PROGRAM	22
TRIPS DURING SEPTEMBER 1964	23
VISITS TO CONTRACTOR'S FACILITY DURING SEPTEMBER 1964	23
FUTURE SIGNIFICANT EVENTS	24
ECP INDEX	25
CCN INDEX	27
LIST OF ABBREVIATIONS	29

INTRODUCTION

This report has been prepared in accordance with the requirements of Item 7 of Contract Number AF33(657)-7868 and is the thirty-third in a series of monthly reports covering activity on the XC-142A VTOL Transport Aircraft Program.

This report is devoted specifically to a summary of progress for the month of September 1964.

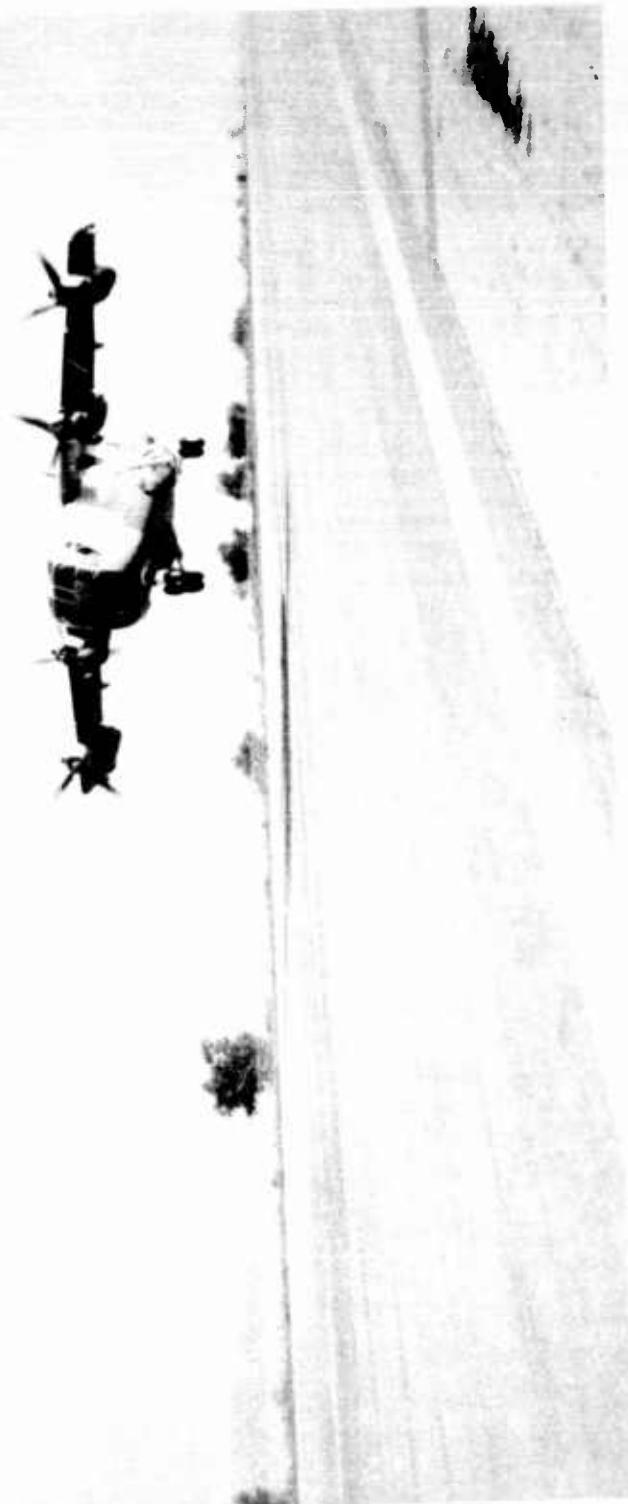
SUMMARY

A major milestone was accomplished during the month with achievement of the first flight of the XC-142A, on 29 September. The flight, made on the #2 aircraft, was 38 minutes in length during which time the aircraft general handling characteristics were checked at an altitude of 10,000 feet and a speed of approximately 150 knots, with landing gear down throughout the entire flight; takeoff and landing were made with wing and flaps at 10 degrees. Throughout the flight, the aircraft demonstrated smooth response and stable aerodynamic characteristics.

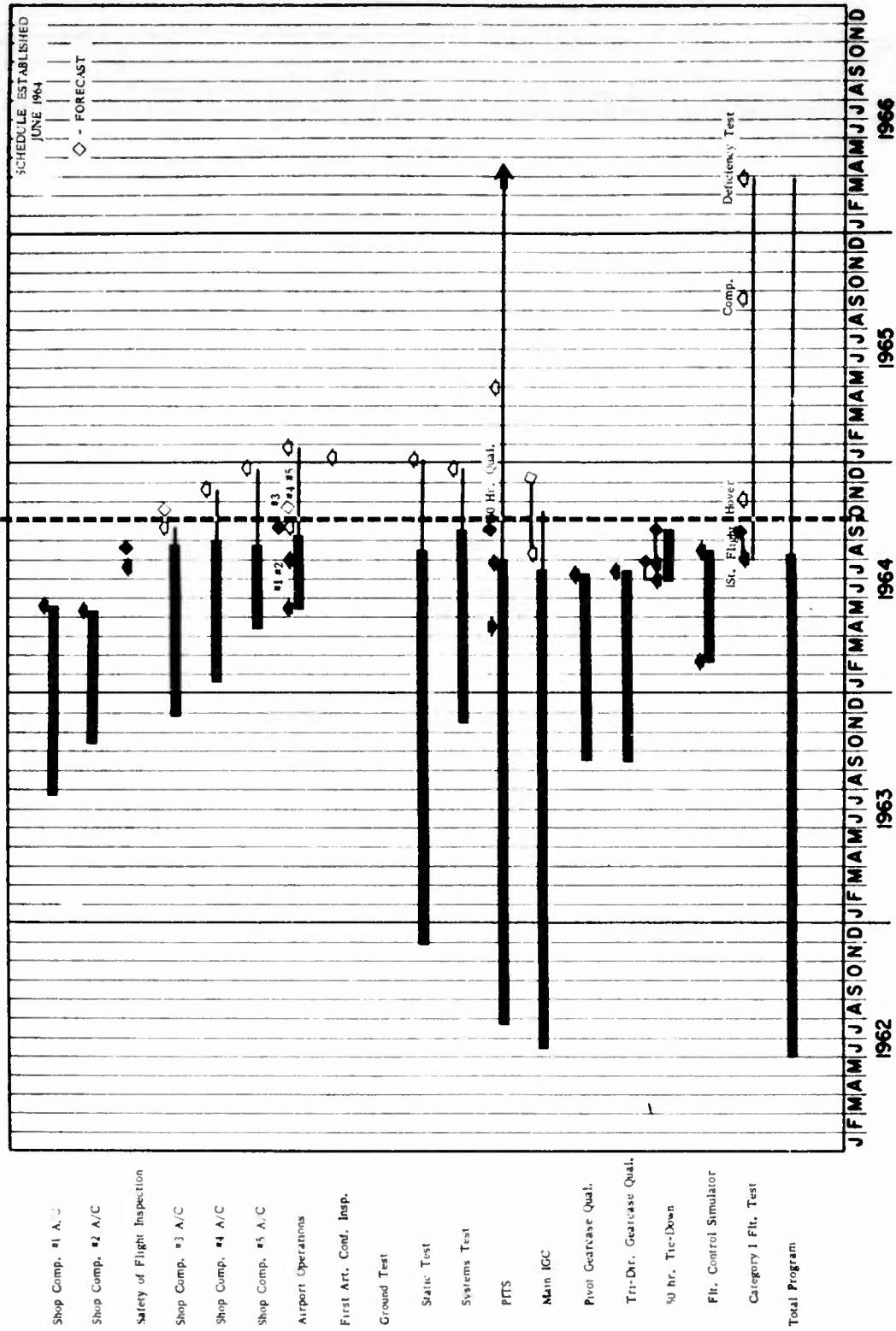
Considering the objectives remaining to be accomplished, the overall XC-142A program at the end of September was estimated to be six to seven weeks behind schedule. Fabrication of aircraft #3-5 remained in a three to five week behind schedule condition, primarily as the result of major component shortages.

In addition to first flight, several other items of significance were accomplished in the overall test program, during the month. High speed taxi tests on the #2 aircraft were achieved, on 19 September; the 50-hour tie-down test on the #1 aircraft was completed, on 22 September, and the teardown inspection of transmission and propulsion system components, was completed on 27 September.

XC-142A No. 2 AIRCRAFT FIRST FLIGHT TAKEOFF 29 SEPTEMBER 1964



TOTAL PROGRAM MASTER PLAN-MILESTONES XC-142A



ITEM 1.A DEVELOPMENT OF XC-142A AND FABRICATION OF FIVE PROTOTYPE MODELS

1.A.1 ACCOMPLISHMENTS

Upon completion of the 50-hour tie-down test on the #1 aircraft, manufacturing effort was devoted to removing and dis-assembling transmission system components for the teardown inspection. At the end of the month, the #1 aircraft was transferred to the Experimental Shop area for installation of replacement transmission system components and general refurbishing in preparation for its initial flight. Subsequent to its initial flight on 29 September, the #2 aircraft was maintained in a flight ready status with anticipation of the second flight the first week in October. Aircraft #3-5 were approximately five weeks behind schedule at the end of the reporting period in the final installation line. Detail parts for reinforcement of the aircraft wings as the result of the static wing failure discussed in the report for last month became available.

Delivery to LTV was completed during the month of the spare set of main integral gearcase propeller systems, the first three integral gearcases for the #3 aircraft and the #3 aircraft tail integral gearcase. Final installations were being completed on the #5 wing in anticipation of shipment to LTV in early October.

1.A.2 PROBLEM AREAS

1.A.2.1 Main Engine Starter Pump

At the end of the month, sufficient hardware had been received to satisfy the requirements for aircraft #1-3 plus one spare unit. Additional deliveries from the vendor are expected throughout the remainder of the year. As the result of a number of failures experienced with the starter pump seal blowing, an analysis was completed at the end of September which indicated the

possible addition of a surge damper and/or a change in the relief valve setting.

1.A.2.2 Flap Actuating Screw Jacks

Qualification failures were experienced by the vendor during the reporting period and an analysis of the failures on both long and short stroke actuators was expected from the vendor by the end of the month.

1.A.2.3 Aircraft Fabrication

Aircraft #3-5 remained in a behind schedule condition during September. Aircraft #5 was removed from the nose and main mid-section fixtures with anticipation of joining in early October. Impact of the late schedule condition of the aircraft on the overall XC-142A program was being reviewed at the end of the reporting period.

ITEM 1.B FABRICATION OF STATIC TEST ARTICLE (Complete)

ITEM 2 FABRICATION OF MOCKUP (Complete)

ITEM 3 GROUND TEST PROGRAM

3.1 ACCOMPLISHMENTS

3.1.1 Wind Tunnel (Complete)

3.1.2 Structural Tests

3.1.2.1 Engine Mount Element Tests (Complete)

3.1.2.2 Static Test Program

3.1.2.2.1 Instrumentation

Instrumentation of the static test article for the cockpit enclosure test was completed.

3.1.2.2.2 Aircraft Drop Tests (Complete)

3.1.2.2.3 Aircraft Static Tests

In accordance with the requirements of the Contract Data Requirements

Document (paragraph 3.4.15.4.1(f)(2) of LTV Specification 2671C), progress of the static test program is reported as required by Specification MIL-A-8868 (ASG) (paragraph 3.8.1). The schedule on page 8 provides a graphic presentation of the static tests conducted to date and the revised estimate for accomplishing the remainder of the static test program. Test condition codes have been revised to be consistent with conditions discussed in the various test plans and in the loads reports. In the discussions that follow, the paragraph numbers and titles refer to those shown on the schedule on page 8.

1. Jig Wing (Complete)
2. Wing Chordwise and Engine Mount Wing-Up Flight (Complete)
3. Aileron/Flap Operation (aileron function)

The aileron operational test results, Part I of LTV Report 2-59900/3R812B, were approved by ASD on 23 September 1964.

4. Aileron/Flap Operation (flap function)

The flap operational test results, Part I of LTV Report 2-59900/3R812B, were approved by ASD on 23 September 1964.

5. Slat Operation

Slat operational test results, Part I of LTV Report 2-59900/3R813A, were in final preparation for submittal to ASD in early October.

6. Control Surfaces and Linkages on Wing

- a. & d. Ailerons

The aileron static test results, Part II of LTV Report 2-59900/3R812B, were approved by ASD on 23 September 1964.

- b. & e. Flaps

The flap static test results, Part II of LTV Report 2-59900/3R812B, were approved by ASD on 23 September 1964.

- c. & f. Slats

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SCHEDULE OF STATIC TESTS

The test results, Part II of LTV Report 2-59900/
3R813A, were in final preparation for submittal to ASD in early October.

g. Control Linkage in the Wing

Wing control linkage test results, LTV Report 2-59900/
3R814A, were in final preparation for submittal to ASD in early October.

7. Static Tests of Control Linkage Located in the Fuselage

b. & c. Test results, LTV Report 2-59900/3R814A, were in
final preparation for submittal to ASD in early October.

8. Drop Test

The drop test results, LTV Report 2-59900/3R821A, were in final
preparation for submittal to ASD in early October.

9. Symmetrical Test

Testing of the wing and fuselage for the Symmetrical Flight
Condition is scheduled to resume during the latter part of December after the
wing is rebuilt.

10. UHT Operational

The UHT operational test results, Part I of LTV Report 2-59900/
3R817A, were submitted to ASD 28 August. Awaiting approval by ASD.

12. Wing Tilt Operation

Test results, LTV Report 2-59900/3R820E, were in final prepara-
tion for submittal to ASD in October.

13. Seat Support Structure (Complete)

14. Tail Boom

The tail boom test results, Part VI of LTV Report 2-59900/
3R820D, were submitted to ASD on 13 September.

15. Wing-Up Flight Fuselage (Wing Pivot Bulkhead)

The wing-up flight condition test of the wing pivot bulkhead

was deleted from the test program in accordance with paragraph 2(c) of LTV letter 2-53030/4L-2161 dated 11 September 1964.

16. Unsymmetrical Flight

The unsymmetrical flight condition test plan, Part II of LTV Report 2-59900/3R820D, was submitted to ASD on 14 September.

17. Rudder Operation

The rudder operation test plan, LTV Report 2-59900/3R818, was submitted to ASD on 28 September.

21. UHT Static Test

The UHT static test results, LTV Report 2-59900/3R816A, were submitted to ASD on 3 August. Awaiting approval by ASD.

3.1.3 Flight Control System Tests

3.1.3.1 Prop Pitch Actuator Transfer Valve

Both the main and tail propeller transfer valve housings were subjected to burst pressure tests using dummy transfer valve assemblies. With the housings at a stabilized temperature of 250 degrees F., the pressure ports were pressurized to 7500 psi for a period of two minutes. Neither housing failed or yielded.

3.1.3.2 Flight Control System Test Stand

The collective and throttle system gain changes for correction of the hover mode sensitivity problem were installed in the simulator and evaluated. Hover control with these mods was satisfactory. Other than this, the simulator remained in a standby status.

3.1.3.3 Airplane Control and Hydraulics Systems Tests (Complete)

3.1.4 Engine System (Complete)

3.1.5 Airplane Vibration Tests (Complete)

3.1.6 Fifty-Hour Tie-Down Tests (Complete - see paragraph 6.1.2)

3.1.7 **Transmission System Tests**

3.1.7.1 **Back-to-Back Stands**

3.1.7.1.1 **Pivot Gearcase**

The final test report covering the 50-hour qualification test of the pivot gearcase was in preparation with issuance anticipated in October. As mentioned previously, a summary report of the test was forwarded to ASD in August.

The #1 aircraft 50-hour teardown inspection revealed that the 210-35955-2 duplex bearings on the input gear of the pivot gearcase were pitted on the balls, the ball separator, and the inner race. The MRC representative attributed this condition to excessive preload and/or insufficient radial clearance in the bearing. All of these bearings in undelivered gearcases were removed and returned to MRC for a check of preload and internal clearance.

3.1.7.1.2 **Tri-Directional Gearcase**

The final test report covering the 50-hour qualification test of the tri-directional gearcase was in preparation with issuance anticipated in October. During the reporting period an additional 20 hours of cycling were logged on the 210-75914-3 steel pump gear, bringing the total time to 70 hours. The test results were satisfactory indicating that the gear is acceptable for use in the 150 hour TBO tests to be run on PITS.

3.1.7.2 **Propulsion Integrated Test Stand (PITS)**

During the first half of the reporting period efforts were concentrated on preparing for start of the 150 hour TBO running, particularly instrumentation calibration, propeller rigging and CSD and governor checkout. TBO testing was initiated on 18 September and the first TBO cycle was completed on 23 September. The second cycle was completed on 26 September. A chip detector indication was observed on the tri-directional gearcase during the first cycle.

This was found to be the result of a sliver from the 75914-3 steel scavenge pump gear plus normal fuzz. The gear was dressed out and continued in service. The third cycle was started on 28 September but was interrupted by problems experienced with high engine T-5 temperature and low horsepower. The engines were cleaned and the runs resumed. At the close of the reporting period, a crack in the #4 propeller blade fiberglass sheath in #4 nacelle propeller was being repaired by HSD. Tests are to resume the first week in October.

3.1.7.3 Structural Tests

3.1.7.3.1 Wing Shaft Fatigue

The final fatigue test shaft (210-85945) was received from the vendor on 28 September and the tests will be started in early October. Fatigue testing of the wing coupling, intermediate coupling, and fuselage shaft couplings will follow.

3.1.7.4 Ball Spline Couplings

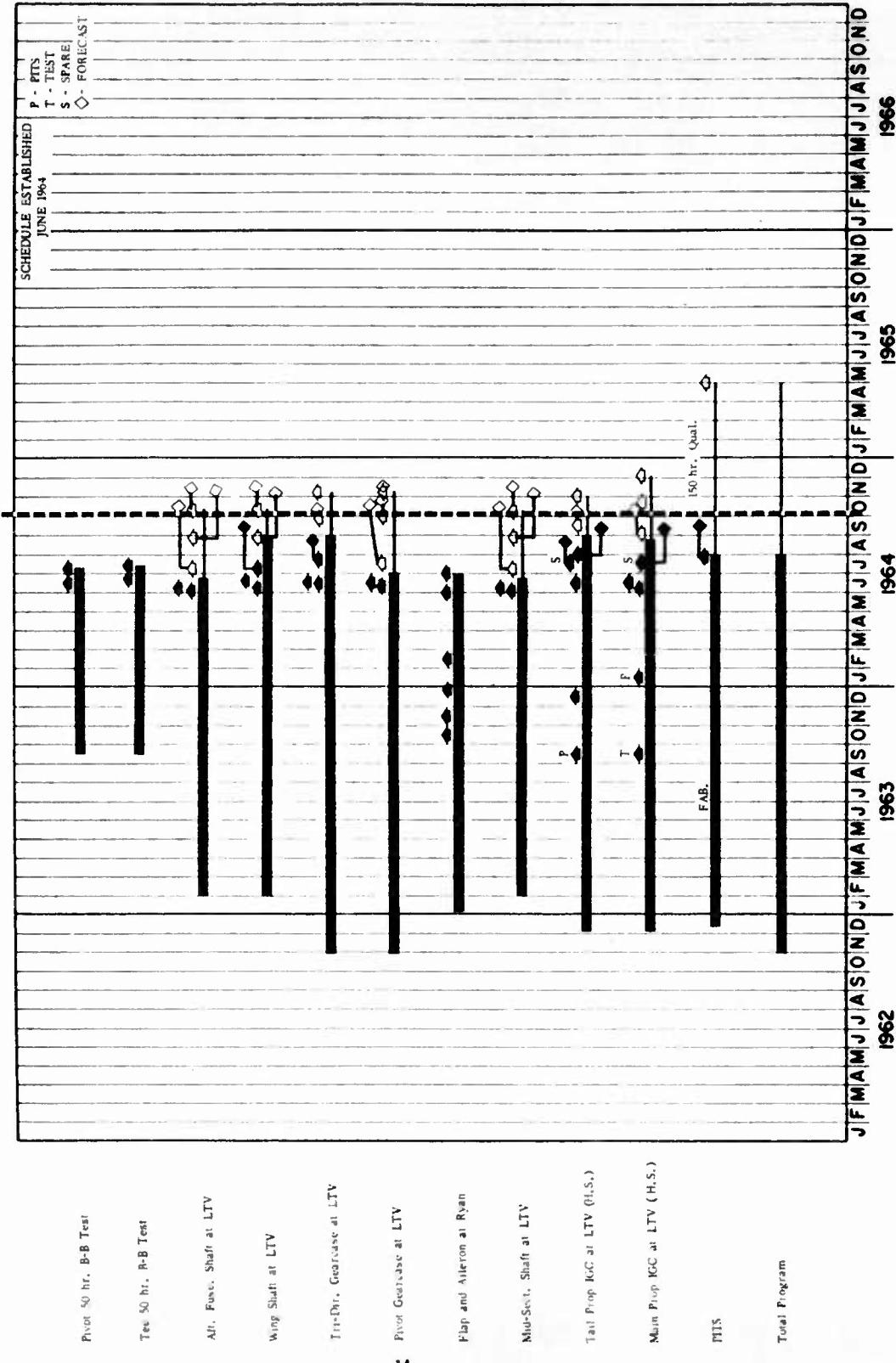
During the 50-hour tie-down tests on #1 aircraft, it was found that the ball spline couplings had galled to the point of being incapable of moving axially. One spline was sectioned and given a Rockwell check that showed the hardness to be R_c 46-49 compared with a drawing requirement of R_c 60. Replacement couplings (same hardness) were installed in the aircraft and the removed units were returned to Bendix for rework. A test on a small specimen cut from an aircraft coupling showed that the material was capable of induction hardening to the R_c 60 level. All other couplings are being checked and reworked as required.

3.1.7.5 Teardown Inspection, 50-Hour Tie-Down Test

The following is a summary of the results of the 50-hour tie-down inspection:

ITEM	TOTAL TIME (HRS)	ACCRED TIME (HRS)	
Tri-Directional Gearcase	135.75	50	No major discrepancies 50 hours flying time.
Pivot Gearcase	92.07	42.75	Duplex bearings on input gear pitted on inner race, cage and balls. 25 hours flying time not to exceed 50 hours total time.
Tail IGC	50.95	23.65	No major discrepancies 25 hours of tail operation or 50 hours total aircraft operation
Main IGC	136.95	50	No. 3 Main IGC had two cracks in barrel (hub). General wear of titanium liner of out- put shaft thrust bearing on all boxes. 25 hours flying time not to exceed 50 hours of total time.
Ball Spline, Wing	27.75	17.70	Brinelling of inner race (see paragraph 3.1.7.4) Excessive pin wear of wing bearings at three pillow block locations. To be inspected after each 5 hours of aircraft operation.
Shafting and Bearings	135.71	50	To be inspected after each 25 hours of flying time.
Main Prop Actuator	75.65	38.75	Seal leakage. On transfer valves, sides of shear pins have excessive wear, "O" rings eroded. To be inspected after 30 hours of total time. Transfer valve "O" rings to be replaced after 10 flying hours. Shear pin to be inspected after 25 hours of flying time.
Tail Prop Actuator	50.90	22.65	seal leakage. "C" clamp failure. Tail "O" rings to be inspected after 20 flying hours.

HILLER MASTER PLAN - MILESTONES
XC-142A



- 3.1.8 Fuel System Tests (Complete)
- 3.1.9 Ejection Seat
- LTV Report 2-59900/3R819B is in final preparation for submittal to ASD in October covering results of ejection seat tests.
- 3.1.11 Hydraulic System
- 3.1.11.1 Component Qualification
- 3.1.11.1.2 Aileron Actuator
- The vibration setup was completed and the vibration tests started.
- 3.1.11.1.3 Master Governor Package
- The setup for vibration tests was completed and the vibration tests started.
- 3.1.11.1.4 Rudder Actuator
- The test setup for life cycling tests and setup operational shake-down were completed.
- 3.1.11.1.5 Roll Feel Isolation Actuator
- The vibration tests were successfully completed and the test setup started for life cycling tests.
- 3.1.11.1.6 Roll Stabilization Actuator
- The setup of the actuator for vibration tests was completed.
- ITEM 4 ENGINEERING DATA
- 4.1 ACCOMPLISHMENTS
- During September, Engineering continued to be primarily devoted to support of the manufacturing and test programs. Particular emphasis continued to be devoted to the 50-hour tie-down tests and the 50-hour teardown inspection, and preparation of #2 aircraft for first flight. Work was also initiated on the wing fix as a result of the static test failure reported in the progress report

for last month. In addition, rebuilding of the static wing was started. Weight of the aircraft at the close of the reporting period was 1669 pounds over guarantee.

ITEM 5 DESIGN DATA

5.1 STATUS OF DESIGN DATA

Design data reports continued to be prepared as required by the Contract Data Requirement Document. During September, reports covering test results of the wing incidence hydraulic motor gearcase, governor monitor, and tail propeller clutch assembly were submitted. In addition, static test results of the tail boom, inboard wing cross shaft and fuselage flexible couplings were submitted. Revisions and/or comments concerning a number of previously submitted reports were submitted in response to ASD requests.

5.2 STATUS OF TECHNICAL DATA

Overall status of design data and surveillance data as of 30 September was as follows:

	<u>Design Data</u>	<u>Surveillance</u>	<u>Total</u>
Total Submissions to Date	183	208	391
Total Submissions to Go	36	18	54
Grand Total	219	226	445
Percent Complete	84%	91%	88%

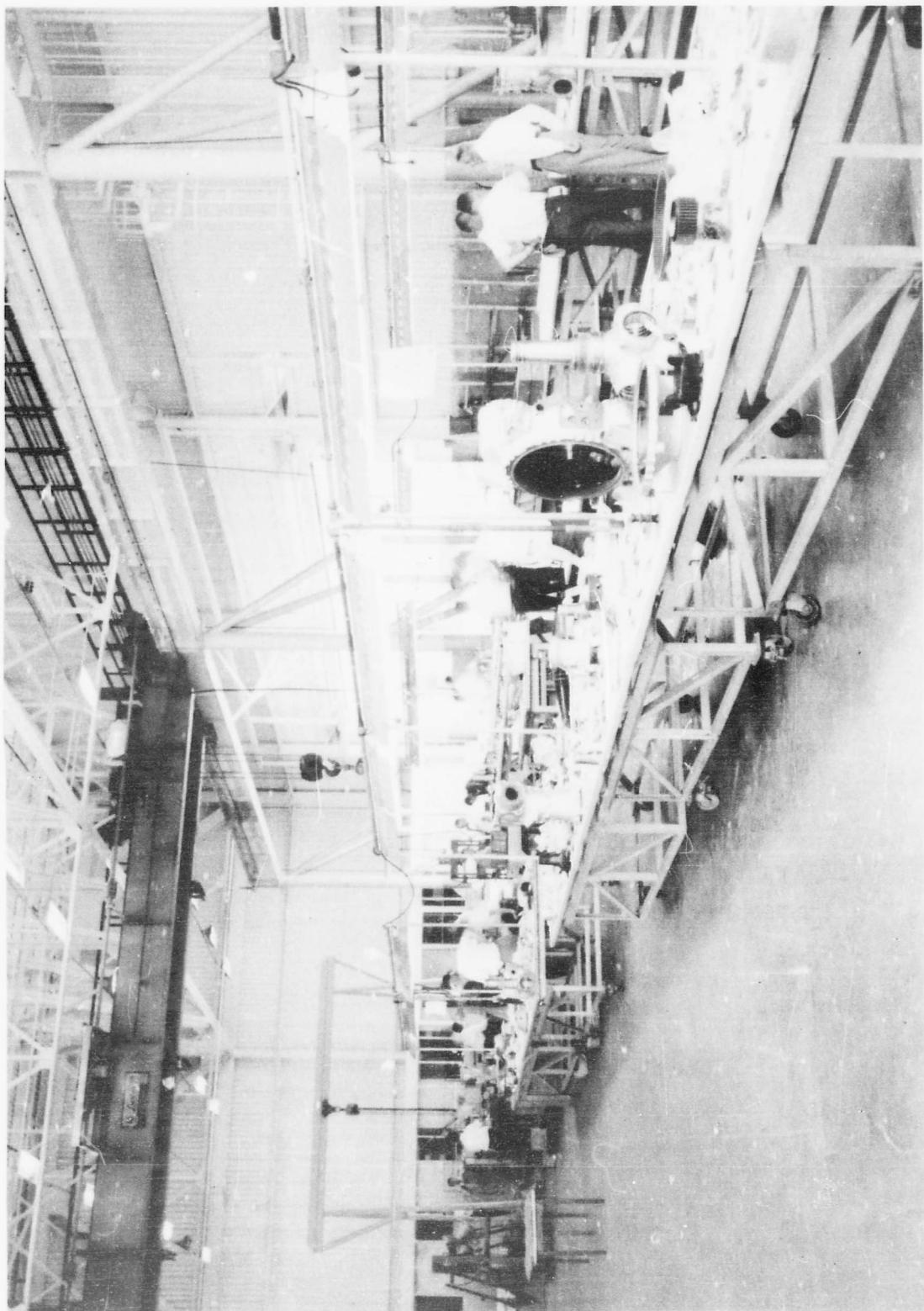
5.3 SCN STATUS

As of the end of September, a total of 139 Specification Change Notices against contract reports had been submitted to ASD. Of these, 90 had been approved, 16 were disapproved, and 33 were pending.

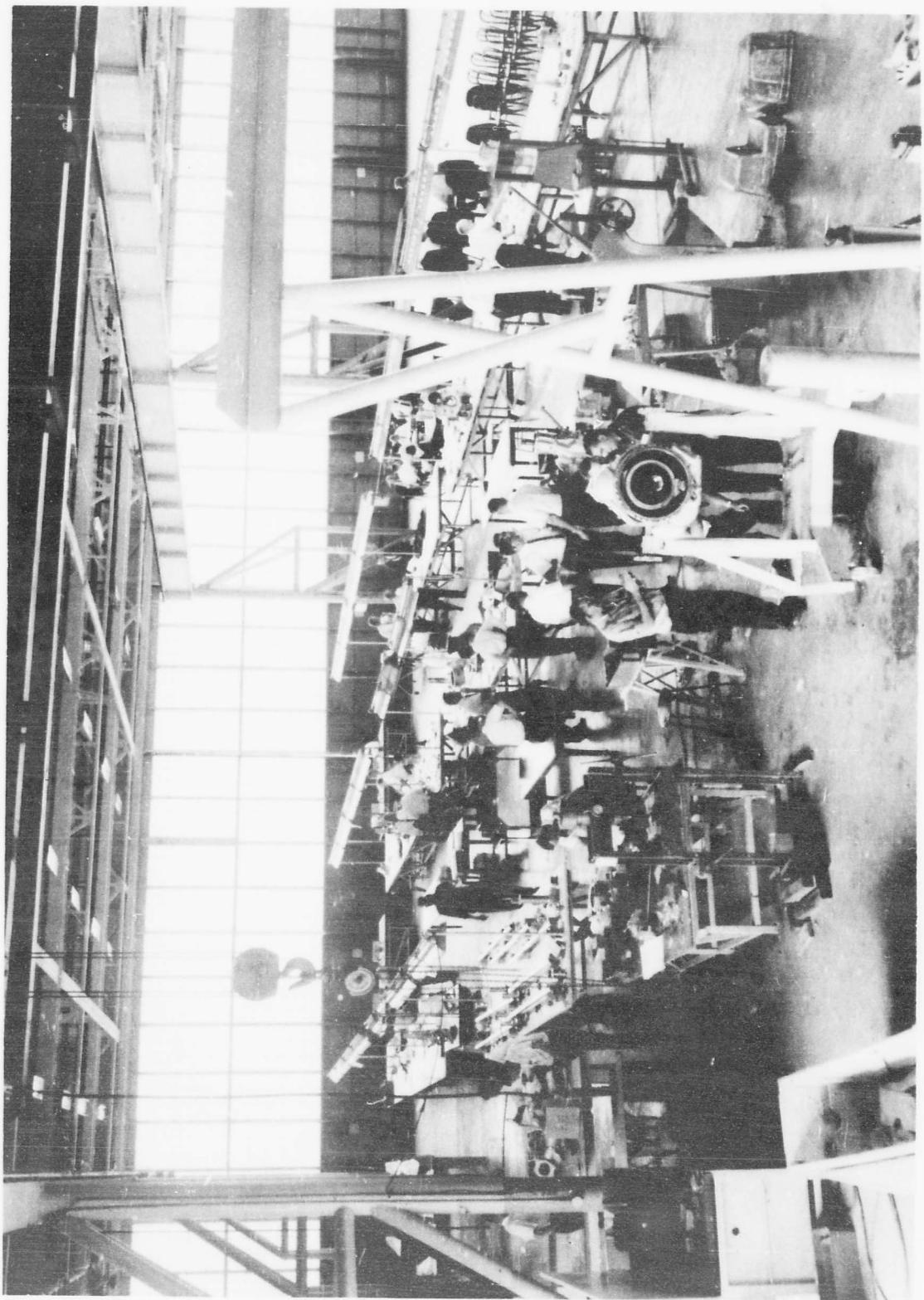
ITEM 6 FLIGHT TEST AND INSTRUMENTATION

6.1 ACCOMPLISHMENTS

6.1.1 Instrumentation



XC-142A No. 1 AIRCRAFT TRANSMISSION SYSTEM COMPONENTS DISASSEMBLED FOR TEARDOWN INSPECTION



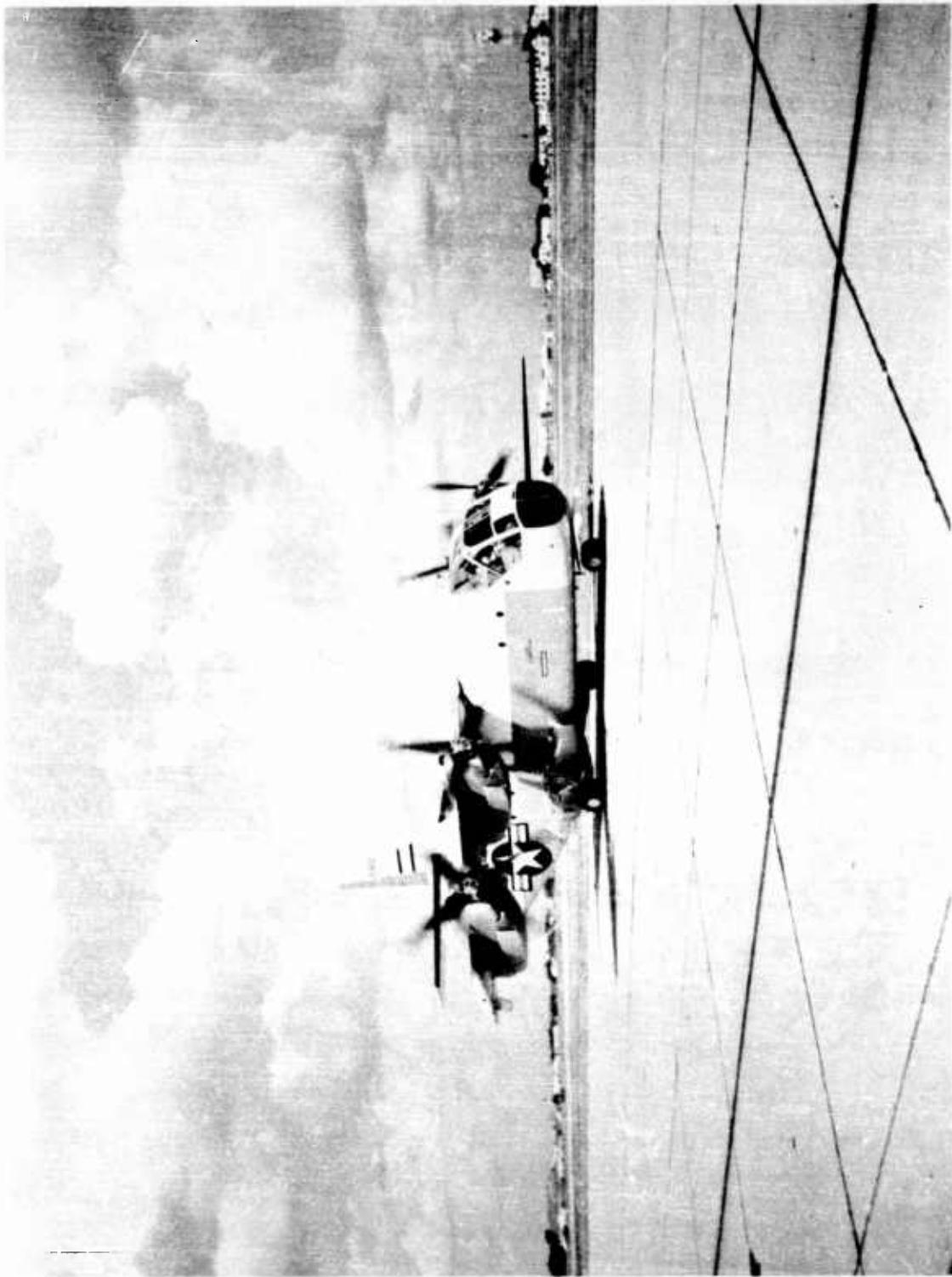
XC-142A No. 1 AIRCRAFT TRANSMISSION SYSTEM COMPONENTS DISASSEMBLED FOR TEARDOWN INSPECTION

The instrumentation effort during September was centered around checkout and calibration of #3 aircraft and the monitoring of instrumentation during tests of #1 and #2 aircraft.

6.1.2 Flight Test

The Contractor completed the 50-hour tie-down tests utilizing #1 aircraft on 22 September. A total of 50 hours and 10 minutes of accredited run time was logged requiring an accumulative total time of 106 hours and 30 minutes. In addition, 30 hours of running was obtained prior to the start of the tie-down tests thereby making a grand total of 136 hours and 30 minutes of aircraft ground operation. Roughly, 27 hours of the total 50 accredited hours were obtained in September. Two significant problem areas were experienced during this period causing a temporary curtailment of running. At 32 hours and 27 minutes of accreditation, the four wing ball splines were removed for inspection. The ball races on each were found to be severely brinnelled due to low hardness (see paragraph 3.1.7.4). Replacement ball splines were installed and inspected at each five to seven hour intervals of the remaining tests. Only slight brinnelling was apparent. At approximately 35 hours of accreditation, the vertical vibration level measured on the #2 Main IGC had increased significantly. The gearcase was removed and partially disassembled. No cause for the increased vibration level could be established. The gearcase was found to be satisfactory with the exception that the main thrust bearing was worn asymmetrically. This was corrected and the gearcase was reassembled and reinstalled. The vertical vibration was still apparent during subsequent running and continued at a high level for the remainder of the test.

A teardown inspection of the transmission system following the 50-hour tests was conducted during the period 23 through 27 September. ASD, LTV, HAC and HSD personnel participated in the inspection (see paragraph 3.1.7.5).



XC-142A No. 2 AIRCRAFT HIGH SPEED TAXI TESTS 19 SEPTEMBER 1964

Following the inspection ASD letter ASZTV/9-200/R&D 19-1/DMJ dated 28 September with BWR Dallas End-1 dated 29 September was released clearing the #2 aircraft for first flight. The letter included replacement and inspection schedules for the transmission components as well as flight restrictions and preflight inspection requirements.

The #2 aircraft performed taxi runs on 18 and 19 September ranging from 60 to 108 knots. The tests were considered satisfactory in all respects although some difficulty was experienced with nose gear steering particularly while taxiing down wind. The initial flight of the XC-142A airplane was conducted on 29 September. Total time of the flight was 38 minutes, maximum altitude was 14,500 feet and maximum airspeed was 148 knots. The flight was reported by the pilot as successful in all respects. Three discrepancies were noted, nose wheel oscillation on landing, lateral direction oscillations during climb at 120 knots, and sensitivity of the collective system. These are being investigated. At the end of September the airplane was being prepared for the second flight scheduled in early October.

ITEM 7 REPORTS

The Technical Progress Report for the month of August was submitted to ASD on 21 September and the Financial Report for the month of August was submitted on 25 September.

ITEM 8 SPARE PARTS FOR FIVE PROTOTYPE AIRPLANES

Of the total of 804 spare items on order, 691 had been completed at the end of the month. Fabrication and procurement of spare parts were 86% complete versus 92% completion scheduled.

ITEM 9 DEVELOPMENT AND FABRICATION OF AGE

At the end of September, the status of AGE development and

fabrication was as follows:

	<u>Through September</u>	<u>Anticipated</u>	<u>Submitted</u>	<u>Approved</u>	<u>Demonstrated</u>
CFE AGERD	161	155	111	11	
GFE AGERD	42	42	38	3	

ITEM 10 SPARE PARTS FOR AGE - No activity during September.

ITEM 11 TRAINING AND TRAINING EQUIPMENT

A Change Order was received in September to reschedule the starting dates of the second classes of the Aircraft Maintenance and Power Plant courses. The new class commencement dates are five days later than originally scheduled.

ITEM 12 CONTRACTOR SUPPORT OF FLIGHT TEST PROGRAM

Revised copies of the Preliminary Flight Manual were submitted to ASD for approval in accordance with current Contract Data Requirements. Formal distribution will be made upon receipt of ASD approval.

A firm proposal for the services of two Technical Representatives at EAFB was submitted to AFLC Olmstead (Procurement Area) by LTV-VA letter 2-60200/4L-63 dated 3 September 1964.

A complete set of Engine and Integral Gearcase Installation drawings was forwarded to AFFTC, EAFB, via LTV-VA letter 2-46300/4L-3007 dated 28 September 1964, for use in preparation of the engine-run test-cell stand for support of Category II Flight Test Operations.

TRIPS DURING SEPTEMBER

<u>DATE</u>	<u>PLACE</u>	<u>PURPOSE</u>
3	Edwards AFB	Discussion of Edwards VTOL Thrust Stand.
10	ASD	Discussion of wing fixes as a result of static wing failure.
1-30	Ryan	Coordination of parts to be shipped to LTV.

VISITS TO LTV DURING SEPTEMBER

<u>DATE</u>	<u>FROM</u>	<u>PURPOSE</u>
8	Army Helicopter School Fort Wolters	Program familiarization
9-11	ASD	Review status of 50-hour tie-down tests
21	Army Air Mobility Div. OCRD	Program status review
23	Tactical Air Warfare Center	Program status review
29	ASD	Review XC-142A wind tunnel effort
29-30	WRAMA	Review Organizational/Field Maintenance Manual and status of GFAE spares and AGE.

FUTURE SIGNIFICANT EVENTS

It is anticipated that the following significant items will be accomplished during the next three months:

October

- Transfer of #3 aircraft to airport area.
- Completion of delivery of aircraft #3-4 shafting.
- Completion of delivery of the first spare and aircraft #3 and 4 pivot gearcases.
- Completion of delivery of aircraft #4 tri-directional gearcase.
- Completion of delivery of aircraft #3 and 4 main IGC propeller systems.
- Completion of delivery of aircraft #4 tail IGC propeller system.
- Completion of the final wing shaft fatigue test.

November

- First flight on #3 aircraft.
- Delivery of aircraft #5 and the spare shafting.
- Completion of delivery of aircraft #5 and the second spare pivot gearcase.
- Start of delivery of aircraft #5 main IGC propeller systems.
- Completion of delivery of aircraft #5 tail IGC propeller system.

December

- First flight on #1 aircraft
- Shop completion of #4 aircraft
- Completion of delivery of #5 main IGC prop system.
- Completion of delivery of the second spare tail IGC propeller system.
- Completion of first turn around of overhaul transmission system components from aircraft #1.

ECP INDEX

<u>ECP No.</u>	<u>Title</u>	<u>Status</u>
1	Fuselage, Installation of Aft Fuselage Escape Doors	Disapproved
2	Electrical, Installation of 35 KVA Generators	Disapproved
3	Electronics, Additional AT-256A/ARC UHF Communications Antenna; Installation of	Disapproved
4	Flight Tests, Category I Inflight Load Survey; Elimination of	Authorized
5	Ground Tests, Escape System Sled Tests; Elimination of	Authorized
6	Fuel System, Ferry Fuel Tank; Elimination of	Authorized
7	Escape System, Douglas Escapac 1-C Ejection Seat in Lieu of LW-1 (Modified) Seat; Installation of	Cancelled
8	Furnishings; Cargo, Troop Accessories for Four Airplanes, Elimination of	Authorized
9	Ground Test, Wing Fatigue Test; Elimination of	Authorized
10	Structural Demonstrator Instrumentation, Addition of	Authorized
11	Ground Test, Structural Failing Load Test, Elimination of	Authorized
12	Navigation Equipment, AN/ARC-21C in Lieu of AN/ARN-52 (V); Provisions for	Disapproved
13	Propulsion System, Integral Gearbox Propeller System Test; Reduction of	*
14	Drawing Quality Requirements; Reduction of	*
15	Weight Control Policy; Revision of	Disapproved
16	Main Propeller IGC Bearing Change	Authorized

<u>ECP No.</u>	<u>Title</u>	<u>Status</u>
17	Aluminum Forging Treatment to Improve Corrosion Resistance	Cancelled
18	Redesign Main Propeller Blade; Full Scale Test at NASA-Ames	Authorized
18-1	Redesign Main Propeller Blade; 0.60 Scale Test at NASA-Ames	Authorized
19	Elimination of Engine Nacelle Anti-Icing	Cancelled
20	Deletion of Category I Flight Tests on No. 4 Aircraft	Authorized
21	Cargo Compartment Trim; Elimination of	Disapproved
22	Revision to Engine Throttle Control Mechanism	Authorized
23	Extension of Category I Flight Test Program	Disapproved
24	Retrofit of Power Takeoff Engine Units	Authorized

* No longer identified as ECP.

CCN INDEX

<u>CCN No.</u>	<u>Title</u>	<u>Date</u>
1	Substitute 35 KVA Generator for 25 KVA Generator	12-19-62
2	Reduction in Data Requirements and Engine Designation Change	4-26-63
3	Substitute 25 KVA Generator for 35 KVA Generator	2-04-63
4	Reduction in IGB Propeller Testing	5-03-63
5	Approval of ECPs 4-9	6-05-63
6	Elimination of Structural Failing Load Tests	7-23-63
7	Approval of ECPs 5, 6, 8, 9, 16	7-23-63
8	Additional Electronic Support Equipment	7-19-63
9	Cancellation of CCNs 5 and 7 and Approval of ECPs 5, 6, 8, 9, 16	8-02-63
10	Partial Cancellation of CCN No. 2 and Rein-statement of Reduction in Data Requirements	8-22-63
11	Partial Cancellation of CCN No. 2 and Rein-statement of Engine Designation Change	8-22-63
12	Approval of ECP 18-1	9-30-63
13	Approval of ECPs 4 and 10	11-13-63
14	Approval of ECP 18	11-19-63
15	Approval of Revision to Contract Data Requirements Document	12-05-63
16	Approval of ECP 20	2-19-64
17	Approval of Inspection of Damaged Engine	3-16-64

CCN INDEX

<u>CCN No.</u>	<u>Title</u>	<u>Date</u>
18	Incorporation of Revision A to Detail Spec into Item 1 of Basic Contract	6-04-64
19	Approval of ECP-24	6-15-64

LIST OF ABBREVIATIONS

A/C	Aircraft
AGE	Aerospace Ground Equipment
AMC	Army Materiel Command
APU	Auxiliary Power Unit
ASD	Aeronautical Systems Division
ATC	Air Training Command
CCN	Contract Change Notice
CFE	Contractor Furnished Equipment
DIET	Design Information Element Test
EAFB	Edwards Air Force Base
ECP	Engineering Change Proposal
GFE	Government Furnished Equipment
IGC	Integral Gear Case
PERT	Program Evaluation and Review Technique
PITS	Propulsion Integrated Test Stand
QEC	Quick Engine Change
SPO	Systems Program Office
UHT	Unit Horizontal Tail
CSD	Constant Speed Drive
WRAMA	Warner Robbins Air Materiel Area
TBO	Time Between Overhauls

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